

ATSDR research needs for asbestos

Site-specific needs

- Health Assessments
- Health Consultations

Substance-specific needs

- Toxicological Profiles
- Priority Data Needs



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Complicating factors in assessing health at Libby

- ◆ Will the real amphibole please stand up?
USGS report
 - Winchite/richterite predominate
 - What is the role of mineralogy?
 - Amphibole studies showing health effects or animal toxicity of "non-regulated" amphiboles were not available
- ◆ Morphological differences
 - Size
 - Berman-Crump model
 - ◆ Only long ($>10\ \mu\text{m}$) fibers matter



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Complicating factors cont'

- ◆ Cleavage fragments
 - Grace comments and R. J. Lee report
 - ◆ Approximately 74 percent of EPA's analytical results include the improper counting of cleavage fragments. Cleavage fragments do not contribute to risk and are forbidden to be counted by applicable regulations. OSHA's rulemaking in 1992 evaluated whether cleavage fragments should be counted as asbestos and concluded that the evidence does not support regulating such fragments as asbestos. 57 Fed. Reg. 24310 (June 8, 1992). The applicable methods for analyzing samples also do not allow cleavage fragments to be counted.



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Other complicating factors

- ◆ Low dose epidemiology studies were not available.
- ◆ Exposure estimates for work place epidemiology studies were weak.
- ◆ The only "accepted" toxicity value was the EPA's IRIS unit risk that was based on both chrysotile and amphibole studies and may not be protective for environments that are predominately amphibole.



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Libby Health Assessment Recommendation

"More research is needed, specifically:
toxicological investigation of the risks
associated with low-level exposure to
asbestos, especially Libby asbestos;
clinical research on treatments for
mesothelioma and asbestosis; and
epidemiology studies to better
characterize the link between exposure to
asbestos and disease."



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Similar complications

◆ Morphology

– Formation

- ◆ NSSGA – cleavage fragments non-toxic
- ◆ RJ Lee – air samples show cleavage fragments

– Size

- ◆ Berman report – critical of width cutoff, other “fibers” not long enough to be toxic

◆ Mineralogy

- RJ Lee – not tremolite but hornblend



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Prioritized research needs

◆ Comparative toxicity studies

– Answer morphological differences

- ◆ Formation processes (cleavage fragments)
 - “pure” material
 - Site-specific material
- ◆ Size (length AND width)
 - Reconcile the human and animal data
 - Width (no good studies)

– Answer mineralogical differences

- ◆ Are there animal studies which can better define the differences we see in epi studies?



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Prioritized research needs, cont'

- ◆ Epi studies
 - Dosimetry is the weak link
 - Low level exposures
- ◆ Soil data
 - What to do with soil data
 - ◆ Are we stuck doing activity-based sampling?
 - ◆ Can we ever say anything more than absent/present?



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Toxicological profiles

- ◆ Identification of data gaps
 - Toxicological profile
- ◆ Identification of "priority data needs"
 - Priority Data Needs Document
 - TASARC



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Exposure

Improved analytical methods for screening samples and determining the chemical structure of asbestos fibers. Also, techniques are needed to normalize studies in which different analytical methods were employed.

Exposure levels, fiber size distribution, and asbestos fiber type in areas with natural geologic deposits of friable asbestos and hazardous waste sites. Also, techniques for estimating air levels of asbestos from soil concentrations and activity scenarios.

Exposure levels for humans living near hazardous waste sites and other populations such as humans living in areas with naturally high levels of friable asbestos.

Potential candidate for subregistry of exposed persons.

Toxicity

Epidemiologic studies of individuals occupationally exposed to asbestos levels lower than those experienced prior to the institution of current occupational standards governing the use of asbestos, but higher than current levels in the general population. These studies should be performed in conjunction with the immunotoxicity studies.

Immunotoxicity studies of individuals occupationally exposed to asbestos.

Development of human and rat lung retention models to aid in extrapolating between rat and human data.



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